

CHAPTER 1

Introduction

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Background

The future of chinook and other salmon in the Puget Sound region is in question. Chinook salmon are far less abundant now than they were even in recent decades, and in March 1999, the species was listed by the federal government as threatened under the Endangered Species Act. In many ways, salmon's decline is intertwined with humanity's way of life; its importance in tribal, commercial, and sport fishing affects both the economy and cultural traditions. The condition of fish habitat is linked to the quality of the environment and the benefits human inhabitants reap from it. The Washington State Legislature has recognized that recovering salmon is good not just for the fish, but for people too.

Scientific research is demonstrating both how human activities have collided with salmon's needs and how people can aid in salmon conservation and recovery. A greater appreciation for salmon's status and decline is prompting citizens to refocus their personal and civic priorities. If salmon are to retain a central role in human culture rather than become a relic of the past, this knowledge and appreciation must lead to action.

There are many causes for the decline in chinook and other salmon populations. These are generally referred to as the H's: harvest, hatcheries, hydropower, and habitat. Efforts are under way at many levels of government to improve management practices in all of these areas. Local governments have the most impact on habitat, particularly through protection, restoration, and land use policies in the watersheds. Harvest and hatchery management are being addressed by the state and the tribes, who are the legal co-managers of the fishery resource. In this watershed, dams are being addressed by local governments. (See Appendix B, WRIA 8 Salmon Conservation Planning, for discussion of other efforts to benefit salmon.)

Just as impacts on the watershed did not occur overnight, so the successful conservation and recovery of naturally produced salmon will take decades to accomplish. It will require a long-term effort, guided by watershed assessment and strategic planning, that will need to be implemented in the field, in council chambers, and in boardrooms and living rooms across the watershed. In the meantime, action must begin, using the knowledge that is available now.

Recognizing that a long-term plan to conserve habitat for chinook salmon will take additional knowledge and several years to develop, elected officials, jurisdictional staff, business and environmental groups, scientists, and concerned citizens have been working together in a voluntary effort to identify and carry out actions that will help salmon in the near term in the Lake Washington/Cedar/Sammamish Watershed. The *Lake Washington/Cedar/Sammamish Watershed (WRIA 8) Near-Term Action Agenda for Salmon Habitat Conservation* is the result of that collaboration. (Please see Map 1 at the end of this chapter to view jurisdictions and watershed boundaries.)

A Note on Watershed Names

The watershed is known by several names, depending on the context in which it is used. The formal name used in the multi-jurisdictional, multi-stakeholder salmon conservation planning process is the Lake Washington/Cedar/Sammamish Watershed. The area is also a state planning unit called Water Resource Inventory Area (WRIA) 8. (The state's WRIA boundary was modified slightly to avoid splitting Elliott Bay, which is wholly included in WRIA 9 for local salmon conservation planning purposes.) Neighborhood stream signage uses the label "Greater Lake Washington Watershed." State reports sometimes refer to the Cedar-Sammamish Basin. To avoid confusion, only the two most commonly used names, the Lake Washington/Cedar/Sammamish Watershed and WRIA 8, are used interchangeably in this document.

Purpose of the Action Agenda

The Action Agenda provides immediate guidance on actions that are expected to begin benefiting chinook salmon while a long-term salmon conservation plan is being developed. The Action Agenda is intended to provide a range of opportunities, in the form of projects and guidance, that jurisdictions, non-governmental organizations, businesses, and interested citizens can undertake within 5 years to improve conditions for salmon. Because there is so much that should be done to recover salmon, it is important to distinguish what steps can be taken in the near-term time frame of the Action Agenda. Presented is a menu of actions that are appropriate to take now, given what is currently known. To do this, the Action Agenda strives to:

- Offer a range of opportunities to improve salmon habitat in the watershed.
- Include actions that can be started or implemented within 5 years.
- Address the factors of decline for salmon habitat.
- Propose actions considered of low risk to chinook salmon and other species.
- Provide policy and regulatory guidance to local governments by recommending outcomes rather than prescribing how to achieve the outcomes.
- Recommend monitored demonstration projects.
- Include research actions that will provide information needed now for development of the long-term conservation plan.
- Be adaptable to new information.
- Include actions that can be implemented with the help of volunteers.
- Recommend actions to improve public awareness of salmon needs and encourage involvement in salmon conservation activities.

- Offer guidance on resources to implement recommended actions.
- Link to related actions outside of the WRIA 8 salmon conservation planning process (such as shoreline master planning, in-basin habitat conservation plans, and critical areas ordinance revisions).

The Action Agenda examines four categories of action: habitat protection and restoration projects; regulatory and policy guidance; public outreach and education; and guidance for research, monitoring, and adaptive management. The primary emphasis is on habitat protection, restoration, and enhancement projects and research. The Action Agenda focuses on chinook salmon and the areas that provide spawning, rearing, and migratory habitat for them, although other species of salmon and bull trout are also expected to benefit.

Salmon conservation in WRIA 8, over both the near and long terms, is grounded in and driven by science. The actions included in the Action Agenda are based on an initial assessment of the natural and human-caused factors contributing to the decline of chinook salmon habitat, referred to in the Action Agenda as factors of decline (see *Salmon and Steelhead Habitat Limiting Factors Report for the Cedar-Sammamish Basin*, Washington State Conservation Commission, September 2001), along with the best professional judgment. Because more science is needed to prepare the long-term salmon conservation plan, the Action Agenda fills a vital need to begin work now.

In discussing the purpose of the Action Agenda, it is also important to understand what the Action Agenda is not intended to be. Although it takes a science-based approach, it is not a technical document, nor is it a salmon recovery plan. Although the actions included here are based on initial technical analysis, they are not ranked or prioritized, have not been evaluated for feasibility, and have not undergone design and construction planning. Also, the Action Agenda is not mandatory, nor is it to be taken as law. Rather, it offers guidance and recommendations that can begin to stem the decline of salmon habitat in the watershed.

The Lake Washington/Cedar/Sammamish Watershed – History and Geography

History

The Lake Washington/Cedar/Sammamish Watershed has been dramatically altered since the first non-native settlers arrived in the region 150 years ago. This transformation started with heavy logging of old-growth forest in the 19th century. The transformation expanded at the turn of the 20th century, when Seattle built the Landsburg Diversion Dam and tapped the Cedar River as its main source of water.

The most drastic change in the watershed occurred between 1910 and 1920, when the Lake Washington Ship Canal and Hiram M. Chittenden Locks were built. The ecological consequences of these alterations were profound. The outlet of Lake Washington was redirected from its south end at the Black River to the north through Lake Union and the Locks. The result was a drop in Lake Washington's level of almost 9 feet, which drained wetlands along much of its shoreline and dramatically changed the lake's confluences with its tributaries. The new outlet

at the Locks and Salmon Bay had almost no features of a natural estuary, presenting an abrupt transition from freshwater to saltwater (and saltwater to freshwater) as well as a significant physical barrier to migrating salmon.

In a separate but likewise profound action during the same decade, the Cedar River was redirected from its normal path of flowing into the Black River (which in turn had fed the Duwamish River) and channelized to flow into Lake Washington to reduce flooding in the City of Renton.

In addition, when the water surface level of Lake Washington was lowered, the water surface of Lake Sammamish was also lowered, and this drained the vast wetland complex that had made up the Sammamish River corridor between the two lakes. The drained land allowed a major expansion of farming in that corridor, which in turn led to the channelization and confinement of the Sammamish River in the early 1920s to a course very close to its current one. Thus the general hydrogeography of the present watershed was established within the first 20 years of the last century.

In the ensuing years, the most important cause of physical change to the watershed has been the expansion of urban and suburban development. In particular, development has altered the hydrology of the watershed, both through changes in land cover and through increased water withdrawals. Changes in land cover caused by urbanization affect salmon habitat primarily by altering flow levels, but these changes have also resulted in the degradation of riparian areas. The removal of forest cover for urban and suburban development dramatically increases the size and frequency of high flows from stormwater in lowland creeks. Clearing and paving tend to further reduce low flows in the summer and early fall, because cleared land and impervious surfaces dramatically reduce groundwater recharge.

Through the 1950s, increasing amounts of water were withdrawn from the Cedar River watershed to support a growing city. Since then, Seattle and the region have developed other water sources, allowing Cedar River diversions to remain relatively stable. Major groundwater withdrawals in the watershed have been made from below the lower Cedar River, lower Issaquah Creek, lower Bear Creek, and Lower Rock Creek (a tributary to the Cedar River).

Following significant floods in the 1950s, countywide flood control efforts in the 1960s led to a dramatic expansion of levees on the Cedar River and local sponsorship of major dredging and levee construction on the Sammamish River by the U.S. Army Corps of Engineers. This in turn supported increased development of the floodplains of both rivers. Meanwhile, expanding urbanization led to heavy residential development of the shorelines of Lake Washington and Lake Sammamish. Residential development also expanded along the bluffs above Puget Sound and along parts of its shoreline. In the early 20th century, the marine nearshore was even more dramatically affected by the construction of a railroad line along most of its length. Bulkheads and other protections for the railroad line and housing developments significantly curtailed natural beach-forming ecological processes of the Puget Sound nearshore.

In addition to these changes in physical habitat, the introduction of non-native fauna and flora significantly changed the biology of the Lake Washington ecosystem. More than 40 non-native fish have been introduced into the watershed; however, some of these introduced species have not survived. Today, there are 24 known non-native fish species in the watershed. Notably, these species include smallmouth and largemouth bass, which are significant predators of juvenile salmon.

Sockeye salmon in the lake system are believed to be primarily the descendants of fry transplanted from Baker Lake in the 1930s. Because juvenile sockeye require a lake for a year or more of rearing, the Cedar River supported few if any sockeye prior to its connection with Lake Washington. However, the Cedar did support runs of pink and chum salmon prior to the river's being redirected into Lake Washington; these runs are now extinct.

The non-native Eurasian watermilfoil now dominates much of the shorelines of Lake Washington and Lake Sammamish. Himalayan blackberry is common in riparian areas throughout the watershed, and Japanese knotweed and reed canarygrass are spreading.

Geography

Approximately 85 percent of the Lake Washington/Cedar/Sammamish Watershed lies within the boundaries of King County, the most populous county in the state. Snohomish County encompasses the remaining 15 percent of the watershed, and this area consists of Bear Creek headwaters, the northern tributaries, and the adjacent nearshore drainage. The Lake Washington/Cedar/Sammamish Watershed is composed of two major physiographic areas. The eastern portion of the watershed, which covers approximately 14 percent of the total area, lies in the Cascade Range while the western portion, which is the remaining 86 percent, occupies the Puget Sound lowland. Primarily because of its elevation, the eastern portion (the upper Cedar River and parts of upper Issaquah Creek) receives much more precipitation, up to 102 inches annually, compared to an average of 38 inches in the western portion of the watershed.

The three basins in the watershed that produce the largest salmon populations, the Cedar River, Issaquah Creek, and Bear Creek, have distinctly different geology, hydrology, and topography. Only the Cedar River, which originates in the relatively high mountain country of the Cascade Range, develops a large annual snowpack. Issaquah Creek originates at the foot of the Cascades in bedrock hills that are too low to hold snow for sustained spring or summer runoff. Bear Creek is a lowland stream system, originating in a large area of forests and wetlands in south Snohomish and north King counties. All the watershed streams, with the exception of the Cedar River, must rely primarily on groundwater to sustain base flows in the summer and early fall.

Alterations to the two major lakes in the watershed, as well as its varied topography, have resulted in ecological complexities not found in other watersheds. Stream environments for salmon in the Cedar River, Issaquah Creek, and Bear Creek are unique to each of these systems; therefore actions to address a particular stream's productivity issues are potentially independent of one another. Recovery goals will need to address these physical differences across the watershed, as well as genetics and production issues.

The lakes have their own complex ecological systems, which are not yet well understood, but which make salmon from WRIA 8 unusual in the Puget Sound region. Native salmon from Bear Creek and other tributaries of the original Lake Washington watershed would have co-evolved with lake habitats. However, the native salmon of the Cedar River evolved primarily in stream conditions. The long-term effect on Cedar River chinook salmon of migrating to and rearing in Lake Washington, rather than in the historic Cedar, Black, and Green/Duwamish River complex, is not known.

Most of the Lake Washington/Cedar/Sammamish Watershed lies within urban growth area boundaries. (See Map 3 in Chapter 4, Project and Research Recommendations Specific to Sub-areas, to view the urban growth area.) However, nearly all of the watershed's most productive salmon spawning habitats are outside this area. WRIA 8 has the largest human population in the state, approximately 1.4 million people (which is more than twice the human population of any other WRIA in the state), despite its being geographically smaller than most. Based on projections by the Puget Sound Regional Council, this population is expected to increase more than 20 percent over the next 2 decades, bringing it to more than 1.7 million in 2020.

Watershed-Based Salmon Conservation Planning – Context and Process

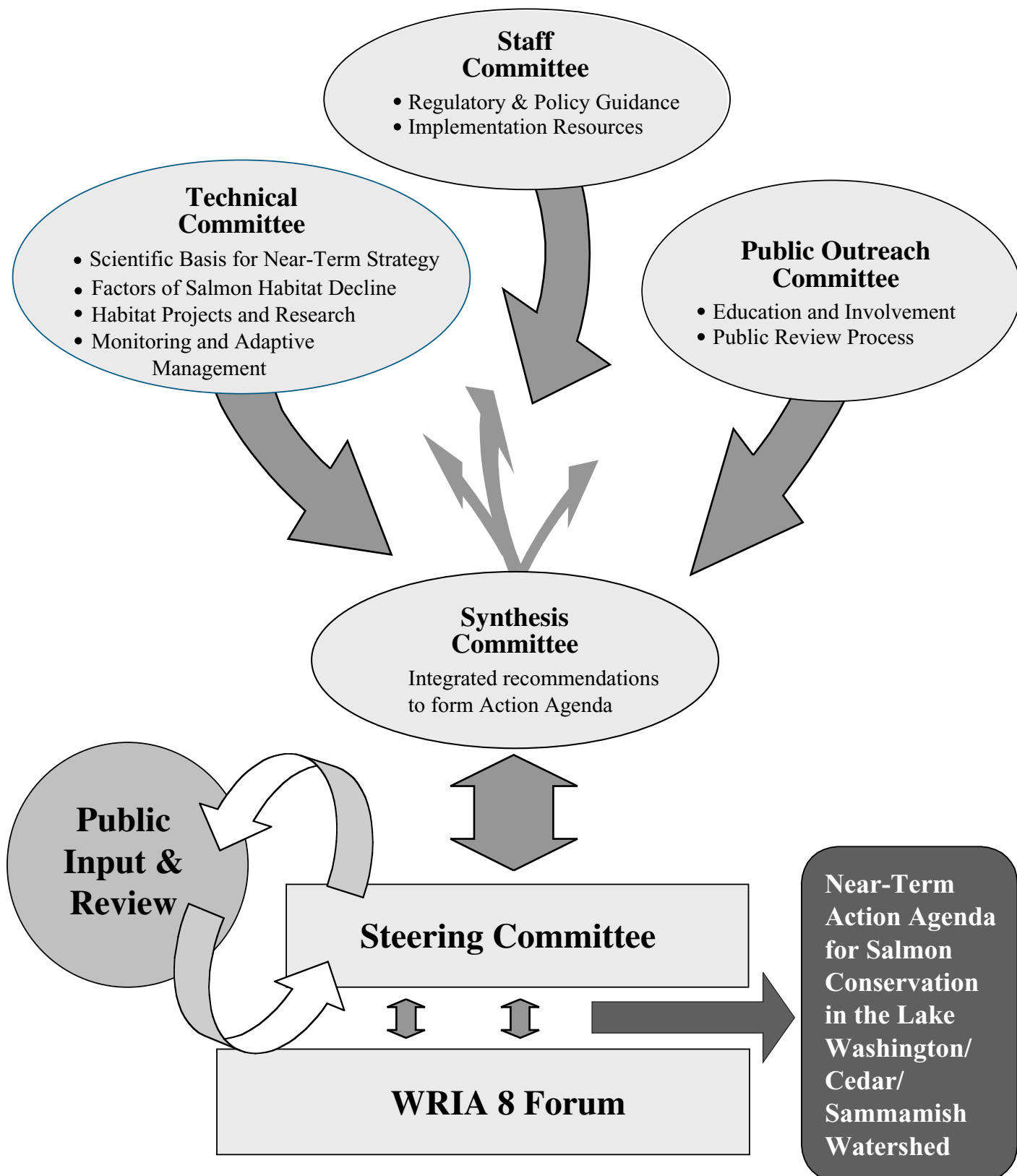
Legal Context

Chinook salmon in the Puget Sound region were listed as threatened under the federal Endangered Species Act in March 1999. The ensuing 4(d) rule resulted in it being unlawful to *take* the species, which includes killing, harming, harassing, or significantly altering its habitat. At the state level, the implementation of the Washington Salmon Recovery Act has led to establishment of multi-jurisdictional, multi-stakeholder committees to recommend projects for restoration and protection of salmon habitat. In the Lake Washington/Cedar/Sammamish Watershed, 27 local governments – consisting of King and Snohomish counties, Seattle, and 24 other cities in those counties – signed an interlocal agreement to jointly fund a planning effort to conserve salmon habitat in the watershed. The historical evolution of and legal context for the WRIA 8 salmon conservation planning process, as well as its relationship to other salmon conservation efforts, is described in more detail in Appendices A and B. Other laws, such as the Growth Management Act and the Shoreline Management Act, also need to be considered in conservation planning. Refer to Appendix C for a discussion of relevant laws and regulations.

Planning Process

A multi-jurisdictional, multi-stakeholder process has been used to compile what is known about habitat conditions and to develop recommendations for the Lake Washington/Cedar/Sammamish Watershed. Figure 1 is an illustration of the planning process. A Steering Committee – composed of local elected leaders, concerned citizens, scientists, and representatives from the business and environmental communities, water and sewer districts, and state and federal agencies – oversees the development of the Action Agenda and the long-term conservation plan.

Figure 1. Process to Develop the Action Agenda



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The Steering Committee meets regularly and offers opportunities for public comment. The Steering Committee set the scope and direction of the Action Agenda, which received significant input and work from four other committees: Technical, Staff, Public Outreach, and Synthesis. Individual jurisdictions and stakeholder groups provided staff and professional resources to each of these committees.

The Technical Committee consists of science professionals who are working to provide the technical foundation and documentation for both near-term and long-term planning efforts. This committee evaluates limiting factors assessments and recommends potential protection, restoration, research, and regulatory actions. The Staff Committee is composed primarily of jurisdiction staff with planning and policy responsibilities; committee members are responsible for developing the policy and regulatory guidance. The Public Outreach Committee is concerned both with developing the public outreach recommendations for the Action Agenda and promoting public involvement in the Action Agenda's review and implementation.

Work products from each of the committees were integrated by the Synthesis Committee, which consists of representatives from each of the other committees. Committee rosters are listed in Chapter 9, Acknowledgements.

The Steering Committee released a review draft of the Action Agenda to the public and held four open houses around the watershed to seek oral and written input and feedback. The Steering Committee then integrated the public comment into a final version that was presented to and accepted by the WRIA 8 Forum. The WRIA 8 Forum consists of elected officials representing the 27 local governments that signed an interlocal agreement to jointly fund salmon conservation planning in the Lake Washington/Cedar/Sammamish Watershed. Now the final Action Agenda is offered as recommended actions and guidance to governments, nonprofit organizations, the private sector, and interested citizens. Because nothing in the Action Agenda is mandatory, each local jurisdiction can choose to adopt or implement the recommendations in a manner consistent with their established procedures, including providing additional opportunities for public outreach and input.

The next step in the planning process to conserve salmon habitat is to conduct a strategic assessment. This assessment involves research and analysis to fill important information gaps, in particular those concerning the health of chinook salmon and bull trout. The strategic assessment will also analyze and synthesize what is currently known to construct a model of habitat conditions in the watershed. The assessment will be shaped by the issues that need to be addressed in the development of a long-term salmon conservation plan for WRIA 8 and will help provide the scientific foundation for the long-term plan. The Steering Committee will work together with policymakers and the public to use what is learned in the strategic assessment to develop the long-term salmon conservation plan. The WRIA 8 Forum will approve or remand the conservation plan before it is submitted to individual jurisdictions.

It should also be noted that the multi-jurisdictional, multi-stakeholder process has already overseen the funding and implementation of numerous projects to stem the decline of salmon

habitat in the watershed. See Map 2 for a list of these projects. In addition, many other such projects are being funded by individual jurisdictions and organizations.

Organization of the Action Agenda

The Action Agenda consists of an executive summary, 11 chapters, and three appendices. Each of the following chapters begins with background and context sections for the information being presented. These sections provide an overview of the information in each chapter, explain why this information is needed and how it was developed, and offer suggestions on how it should be used. The chapters of the Action Agenda (with the exception of this introduction) are organized as follows:

Chapter 2 – Near-Term Strategy – Provides near-term strategy, guidance, and principles to ensure that near-term actions are scientifically based, will be consistent with ecosystem objectives, and lay the foundation for the long-term salmon conservation plan.

Chapter 3 – General Action Guidance – Contains guidance and criteria for jurisdictions and organizations interested in selecting, planning, and implementing habitat improvement projects or in modifying policies and regulations beyond the specific recommendations offered in the Action Agenda. This chapter addresses conditions across a broad geographic area rather than identifying specific sites and is organized by factors of decline for salmon habitat in the watershed.

Chapter 4 – Project and Research Recommendations Specific to Subareas – Provides an initial list of recommendations for site-specific habitat protection and restoration projects as well as research to address identified factors of decline for salmon habitat. The recommendations focus on those subareas that are used by chinook salmon at various life stages: core production subareas, migratory and rearing corridors, and satellite production subareas.

Chapter 5 – Regulatory and Policy Recommendations – Contains specific proposals designed to provide local governments with a starting point for evaluating, updating, or improving enforcement of policies and regulations that are linked to salmon conservation. Regulations and policies are a crucial piece of the salmon conservation puzzle because they can help prevent habitat loss.

Chapter 6 – Education and Public Involvement – Presents a broad set of education, outreach, and incentive opportunities for local governments, nonprofit organizations, citizen groups, and others to increase public awareness, acceptance, and involvement in the activities that will lead to salmon habitat conservation.

Chapter 7 – Adaptive Management, Monitoring, and Research – Discusses the development of research, monitoring, and adaptive management components to assess how well the implementation of projects and programs achieves salmon habitat conservation goals. Use of these components will also allow for modifications as new information is learned. Immediate

development is necessary in order to funnel new knowledge into the long-term salmon conservation plan.

Chapter 8 – Implementation Resources – Suggests resources to assist local governments, nonprofit organizations, citizen groups, and others with implementing the recommendations of the Action Agenda. Resources include example ordinances and regulations, relevant publications and websites, partnership opportunities, and grants and funding sources.

The last three chapters offer reference information related to the Action Agenda:

Chapter 9 – Acknowledgements – Acknowledges those participating in the Lake Washington/Cedar/Sammamish Watershed salmon conservation planning process.

Chapter 10 – Bibliography – Lists sources used to develop the Action Agenda.

Chapter 11 – Glossary – Defines technical terms used in the Action Agenda.

The three appendices to the Action Agenda provide information on the history of regional planning in WRIA 8, related efforts to help recover salmon, and relevant laws and regulations for the process.

Website

The website address for the watershed-based salmon conservation planning effort in the Lake Washington/Cedar/Sammamish Watershed is <http://dnr.metrokc.gov/wrias/8>.

Map 1. Lake Washington/Cedar/Sammamish Watershed

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Map 2. WRIA 8 Projects Funded Through Regional Process

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